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# DATA ABOUT THE MOLLUSCS OF ADRIA

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The data presented in this paper were collected by K. Báb a, according to the points of view of a previous discussion with A. Horváth, in August 1966. Our purpose was to study the qualitative and quantitative division of molluscs in the littoral biotopes. The collection has taken place in two ways. (A) Cenological collection, collecting every specimen in a square area of definite size. (B) Individual collection, collecting the molluscs found during perambulating a larger area. The results of these collections are made known one by one, as follows. The numbers, written after the Latin names of species, are meaning the number of the found specimens, after them it is indicated in brackets, as well, how many of them were juvenile specimens.

## Cenological collections

Rocky bay, 1 km from the village Grljévac-Postrana, extension about 1—1.5 km.

**(1)** August 16th. Muddy bottom in front of the camping ground, about 20 m from the coast, from a depth of 1—2 m, among algae *Posidonia oceanica* L., on a surface of 1 sq.m. On the bottom there were *Loripes lacteus* (L.) 11 (8 juv.) and *Gafrarium minimum* (M o n t.) 1. On the alga: *Calliostoma zizyphinus* (L.) 1. In some more square metres, examined for control, there were *Loripes lacteus* (L.) 3—7 and *Cerithium vulgatum* B r u g. 2—3, per sq. metres.

Near the coast there were on the alga *Ulva lactuca* L.: *Rissoa variabilis* (v. M ü h l f e l d) 2.

Dominant species is: *Loripes lacteus* (L.).

**(2)** August 17th. Distance from the coast is 5—10 m, depth 3 m, the substratum is sandly, vegetation: *Posidonia oceanica* L. From 1 square metre we have got the following seven species. *Loripes lacteus* (L.) 8, *Codokia reticulata* (P o l i) 1, *Venus verrucosa* L. 1, *Venus gallina* L. 1 empty shell, *Venerupis aureus* (G m e l i n) 2 juv., *Abra alba* (W o o d) 3 empty shells (2 juv.), *Donacilla corneum* (P o l i) 1 empty shell.

Dominant species is, also here, *Loripes lacteus* (L.).

**(3)** August 17th. Distance from coast 3—5 m, depth 1.5 m, rock mass, vegetation: red algae *Sphaerococcus* and *Pterocladia*. Size of sample is 25×25 sq. cm. Number of species collected: 13. *Calliostoma zizyphinus*

(L.) 7 (2 juv.), *Gibbula adansoni* (P a y r.) 33 (9 juv.), *Leptothyra sanguinea* (L.) 2, *Tricolia speciosa* (v. M ü h l f e l d) 1 juv., *Rissoa variabilis* (v. M ü h l f e l d) 32 (11 juv.), *Zippora membranacea* (J. A d a m s) 1, *Cerithium vugatum* B r u g. 1 worn empty shell, *Muricidea blainvillei* (P a y r.) 4, *Columbella rustica* (L.) 3, *Pisania maculosa* 5 (1 juv.), *Nassa incrassata* (M ü l l e r) 2, *Mitra ebenus* L a m. 1, *Facelina drummondi* (T h o m p s o n) 2.

Dominants are *Gibbula adansoni* (P a y r.) and *Rissoa variabilis* (v. M ü h l f e l d). There are more of both of them than of the other eleven species together.

**(4)** August 18th. In the middle of the bay, or so, about 500 m from the coast, there is a rock mass rising out at low water. Its diameter is 7—10 m. In the rock part below the low water mark until the depth of 1 m from the level of low tide, on the bare surface of rock (without macroscopic vegetation) the results of two samples from 1 sq. m are as follows. *Haliotis lamellosa* L a m. 3 (2 juv.), *Diodora italica* (D e f r a n c e) 2—4, *Patella coerulea* L. 8—11, *Patella scutellaris* L a m. 8—10, *Patella lusitanica* G m e l i n 13, *Gibbula divaricata* (L.) 1—2, *Monodonta turbinata* B o r n 13 (5 juv.), *Vermetus arenarius* (L.) 4—6, *Cerithium vulgatum* B r u g. 1—3, *Natica millepunctata* L a m. 1, 0.5 m deep, from a depth of 1.5—2 m some more specimens, too, have been found. *Cypraea spurca* L. 1, *Murex trunculus* L. 1—1 juv., *Tritonalia erinacea* (L.) 1—1, *Columbella rustica* (L.) 2—3, *Pisania maculosa* L a m. 2—3, *Fusus syracusanus* (L.) 1—2, *Conus mediterraneus* B r u g. 3—5, *Lithophaga lithophaga* (L.) en masse, *Ischnochiton rissoi* (P a y r.) 3, *Chiton olivaceus* S p e n g l e r 3—5.

Dominant species is *Lithophaga lithophaga* (L.) Number of species 21.

**(5)** August 18th. Island opposite to the bay of Grljévac-Postrana, about 3 km from it. Sandy bottom in front of the concrete mole, depth is 8—10 m. Per square metres: *Cerithium vulgatum* B r u g. 3—10 and *Pinna nobilis* L. 1—3. On one of the developed *Pinna nobilis* L. specimens the following eight specimens have been stuck: *Vermetus arenarius* (L.) 15, *Vermetus triqueter* B i v o n a 5, *Arca lactea* L. 1 juv., *Chlamys pusio* L. 1, *Lima lima* (L.) 1, *Chama gryphoides* L. 3 (2 juv.), *Cardium papillosum* P o l i 1, *Saxicava arctica* (L.) 9, (6 juv.).

Dominants are the *Vermetus* species and *Saxicava arctica* (L.).

On the concrete molo, in a depth of 3 metres, there stuck 5 juvenile specimens of *Modiolus adriaticus* (L a m.).

**(6)** August 19th. Trogir. Part of the concrete littoral of the town, at the bridge, depth 3 metres. On the *Vermetus arenarius* (L.), stuck to the side of concrete, there stuck the *Bryozoa Tubicellaria cereoides.* Its height was 30 cm, diameter 50 cm, and the following molluscs were living on it: *Bittium reticulatum* D a C o s t a 5 (2 juv.), *Nassa incrassata* (M ü l l e r) 4, *Mytilus galloprovincialis* L a m. 25 (10 juv.), *Chlamys varius* (L.) 7 (4 juv.), one of the seven specimens, a juvenile one, was redish, the colour of the other specimens, however, was greyish blue.

*Chlamys pusio* L. 3 juv., of redish colour. *Pecten maximus* (L.) 1 juv., *Spondylus gaederopus* L. 1, *Ostrea edulis* L.: two specimens of 5 cm.

Dominant was *Mytilus galloprovincialis* L a m.

**(7)** From the 0.5 m deep underwater zone of the concrete sea wall till its 0.5 m high overwater zone, still under the influence of surf, in an area of 1 square metre there have lived the following species. *Monodonta turbinata* (B o r n) 15 (10 juv.), *Littorina neritoides* (L.) 30 (8 juv.), *Bittium reticulatum* D a C o s t a 8 (2 juv.), *Columbella rustica* (L.) 8 (3 juv.).

Dominant was *Littorina neritoides* (L.), retired into the crevices of concrete, familiar both under and over the water level.

## Individual collections

The site of the individual collections was the bay by Grljévac -Postrana, where the cenological collections Nos. 1—4, as well, have taken place. The results are made known in the following, arranged according to depth, referring to the number of specimens and the environment.

In a depth of 0.5—1 m.

25 species. *Ischnochiton rissoi* (P a y r.) 3, *Middendorfia caprearum* S c a c c h i 1, *Chiton olivaceus* S p e n g l e r 5 (4 juv.), in 0.5 m deep, scattered on bare rocks. *Haliotis lamellosa* L a m. 1 juv., on a bare rock 1 m deep. *Diodora italica* (D e f r a n c e) 3, 0—0.5 m deep. *Diodora graeca* (L.) 1. *Patella coerulea* L. 20. *Patella scutellaris* L a m. 19. *Patella lusitanica* G m e l i n 1. *Calliostoma zizyphinus* (L.) by water surface 1, it is common about 1 m deep, occurring here and there in groups. On vegetation. *Gibbula divaricata* (L.) 16 (12 juv.) stuck on rocks. *Gibbula varia* (L.) 4 (3 juv.), on rocks and under stones. *Monodonta turbinata* (B o r n) on rocks, en masse. *Monodonta articulata* (L m.) 1, *Clanculus cruciatus* (L.) 1, on a rock, *Littorina neritoides* (L.) common on littoral cliffs. *Alvania cimex* (L). 1, on vegetation. *Rissoa variabilis* (v. M ü h l f e l d) are common 0.5—1 m deep, among vegetation. *Cerithium vulgatum* B r u g. under stones, sporadically. The species *Columbella rustica* (L.) and *Pisania maculosa* (L a m.) on rocks, stones sporadically. *Cythara taeniata* (D e s h a y e s) 1, under a stone. *Philbertia purpurea* (M o n t a g u) 1, under a stone. *Conus mediterraneus* B r u g. On rocks and stones scattered. *Lithophaga lithophaga* (L.), pierced into rocks, en masse. *Pecten jacobaeus* L., 1 broken, empty shell, cast ashore. *Venus verrucosa* L. 1 juv., under a stone.

In a depth of 1—3 m.

*Diodora graeca* (L.) 1 ,2 m deep on a rock. *Patella coerulea* L., on a rock. *Calliostoma zizyphinus* (L.), on a rock. In a depth of 1.5 m, on vegetation there were the following four species: *Gibbula adansoni* (P a y r.) 1, *Gibbula divaricata* (L.) 1, *Gibbula adriatica* (P h i l i p p i) 1, *Gibbula varia* (L.) and *Monodonta turbinata* (B o r n) on a rock. *Vermetus arenarius* (L.) and *Vermetus triqueter* B i v o n a normally occur on rocks, till a depth of 10 metres, with 1—5 specimen numbers per a square metre. *Bittium reticulatum* D a C o s t a 2 juv., under stones. *Cerithium vulgatum* B r u g. among stones. *Cerithium rupestre* R i s s o 9 (3 juv.),

in a depth of 2—3 m, on stones and under them. *Murex brandaris* L. 2 juv. *Muricidea blainvillei* (P a y r.) 18 (10 juv.) under stones. *Tritonalia erinacea* (L.) 6 (4 juv.), between 1—8 m, sporadically. *Columbella rustica* (L.), among vegetation, scattered. *Euthria cornea* (L.) 2 (1 juv.) on stones. *Pisania maculosa* (L a m.) on stones, scattered. *Nassa mutabilis* (L.) 1, on a rock, 2 m deep. *Fasciolaria tarentina* L a m. 1 empty shell, on a stone, 3 m deep. *Fusus syracusanus* (L.) 2 (1 juv.), on stones, between 2—3 metres. *Mitra ebenus* L a m. 1, under a stone 1.5 m deep. *Conus mediterraneus* B r u g. under stones, scattered. *Arca barbata* L. 2 (1 juv.) in the crevices of cliffs. *Lithophaga lithophaga* (L.) pierced into rocks en masse. *Spondylus gaederopus* L. 1, among rocks. *Lima inflata* (C h e m n i t z) 1 empty shell, its size was 2.5 cm. *Anomia ephippium* L. 1 juv., under a stone. *Codokia reticulata* (P o l i) 3, in the sand drifted among cliffs, 1.5 m deep. *Cardium exiguum* G m e l i n 2 empty shells among the cliffs in sand. *Venus multilamella* L a m. 1 juv. empty shell, 2 m deep, under a stone. *Venerupis decussata* (L.) 4 (2 juv.) under stones, *Venerupis aureus* (G m e l i n) 3 (2 juv.), under stones, *Gastrana fragilis* (L.) 2, among algae, 3 m deep. *Sepia officinalis* L. 1, in a crevice of rock, 2 m deep. Three nodules of this species have been found among plants, in a depth of 1.5 metres.

In a depth of 3—10 m.

*Astraea rugosa* (L.) 1. *Vermetus arenarius* (L.), *Vermetus triqueter* B i v o n a, *Cerithium vulgatum* B r u g., *Murex brandaris* L., *Tritonalia erinacea* (L.), *Columbella rustica* (L.), *Lithophaga lithophaga* (L.). From sponges *Ircinia*, in a depth of three metres, 2—3 *Saxicava arctica* (L.) have occurred on the average in a sponge. Similarly in a depth of three metres, in a sponge *Cacospongia scalaris* there were two species: *Chlamys varius* (L.) 1, and *Saxicava arctica* (L.) 2.

## Summary

Number of the collected species is 78 together, from that *Amphineura* 3, *Gastropoda* 44, *Bivalvia* 30, *Cephalopoda* 1. From the investigated biotopes there will doubtlessly be found other more species, as well, our fauna list is, therefore, not complete but it is already detailed. The thorough examination is evidenced, anyhow, by resulting in rare species, as well: *Leptothyra sanguinea* (L), *Fasciolaria tarentina* L a m., *Gafrarium minimum* (M o n t.).

Into the cenological sample, few in number and small in size, there could get only a small part of species having but a subordinated role in the biotope, besides the dominant species. The differences of the fauna according to biotopes are demonstrated yet well by these samples. It is obvious, how rich the 25×25 sq. cm sample was from a rock overgrown with red algae (13 species), in contradiction to the greater part of the sq. m samples. The living conditions here have been more favourable the rocky shoal of the bay (No. 4) has produced the most species (21 species) among the cenological samples. An explanation of that may be that it is surrounded already by a rather open sea. The individual collections have resulted in a greater number of species than the cenologi-

cal samples because the investigated area was larger. From the results there could be drawn more other inferences, as well, it is, however, better instead of conjectures to wait for the results of further investigations.

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